

JOURNAL

OF THE

New York Entomological Society.

Vol. XIII.

SEPTEMBER, 1905.

No. 3

Class I, HEXAPODA.

Order II, COLEOPTERA.

THE DISTINCTIVE CHARACTERS OF THE EAST-ERN SPECIES OF THE GENERA *DYTISCUS* AND *CYBISTER*.

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All the species of the genus *Dytiscus* are of large size, the upper surface of dark color with a yellow stripe along the side of the thorax and elytra; the clypeus is yellow, and there is on the middle of the head an angular yellow mark; in addition to these yellow marks some species have the anterior and posterior margins of the thorax yellow, and the eyes margined with yellow. The color of the under surface is either pitchy black or yellow, or is intermediate between the two, or a mixture of them.

The form is comparatively little convex, always elongate, but of variable width.

The clypeus is always separated from the head by a suture visible across the whole width of the head. This entire clypeal suture, so far as has been observed, exists only in this genus and in the European genus *Meladema* in the Dytiscidæ, although it occurs in *Pelobius* and *Amphizoa*, and is common in the Carabidæ. The prothorax is destitute of a lateral margin. The prosternal process is of variable length, rather elongate and narrow, distinctly margined at the sides and is received into a groove of the metasternum.

The hind legs are but little developed for swimming being long

and rather slender. Their tibiæ are usually about three times as long as broad; the tarsi are considerably longer than the tibiæ and are terminated by two rather slender, curved, nearly equal claws. In the more perfect species, as *hybridus*, the swimming legs have become shorter and thicker and their claws more unequal.

The hind coxæ are rather small and the wings of the metasternum of moderate area; the coxal notch is elongate, and beyond it the coxal processes tend, in numerous species, to lengthen and become slender, so as to form two spinous projections in the extreme cases.

The anterior tarsi of the male are very highly developed; the three basal joints are very much dilated and form a nearly circular saucer, fringed at the edges beneath with elongate hairs, and bearing on their under surface two large palettes at the base, and elsewhere a dense pubescence—each hair bearing a minute palette at its extremity; the fourth and fifth joints are not dilated, the latter elongate.

The middle tarsi of the male have the three basal joints dilated and elongated, the three together assuming a narrow, parallel form, and are densely clothed beneath with a glandular or spongy pubescence.

In many species the females are dimorphic, one form being nearly similar to the male in sculpture, while the other bears deep elongate grooves on the elytra.

The species of *Dytiscus* inhabit the northern parts of the new and old worlds, and Persia and Japan have each one peculiar species.

The species of *Cybister* are also of large size and there are numerous species scattered over the whole world. They differ from *Dytiscus* in that the males have only a single claw on the hind tarsus; the females also usually have only one, and in certain cases a rudimentary second on the underside at the inner edge of the larger one. The prosternum is not channelled.

We have but one eastern species.

Dr. D. Sharp has separated *Dytiscus* into four groups as follows:

Group I.—Labrum distinctly emarginate in middle; apices of coxal processes *not* spinose. Into this group fall our species *fasciventris*, *hybridus*, *verticalis*, *marginicollis*, *sublimbatus* and *marginalis*. Of these we have in the East *fasciventris*, *hybridus*, *verticalis* and perhaps *marginalis*.

Group II.—Labrum distinctly emarginate in middle; apices of coxal processes acutely spinose. Into this group fall *circumcinctus*, *parvulus*, *rexatus* and *dauricus*.

Of these we have in the east *dauricus* only.

Group III.—Labrum truncate in middle; apices of coxal processes acutely spinose; margins of elytra dilated. America is not represented in this group, the one species being from northern Europe.

Group IV.—Labrum nearly truncate in middle; apices of coxal processes obtuse; margins of elytra nearly simple.

Represented by one species, *harrisii*, which is found here in the East.

Of *Cybister* we have one species here, *fimbriolatus*, easily separated from *Dytiscus* by the generic characters and by its general form, which, instead of being regularly ovate, is more or less wedge-shaped on account of its being quite rapidly narrowed from base of thorax to head, and gradually broadened from base of thorax to one third from apex of elytra.

Having eliminated *Cybister fimbriolatus*, the only eastern *Cybister*, this leaves us with six species of *Dytiscus* to differentiate, namely: *fasciventris*, *hybridus*, *verticalis*, *marginalis*, *dauricus* and *harrisii*. At a casual glance the three most likely to be confused are *verticalis*, *dauricus* and *harrisii*, as all are of large size and similar form.

We can easily distinguish *verticalis* from the other two by the absence of a yellow apical and basal thoracic margin, and we can at once separate *dauricus* from *harrisii* by the form of the coxal processes. In *harrisii* they are rounded and blunt, in *dauricus* produced into a sharp spine. There is also the group character in the shape of the clypeus—*dauricus* DISTINCTLY emarginate; *harrisii* nearly truncate or scarcely at all emarginate.

The only other species likely to be confused with these is *marginalis*, but it is smaller than the other three and the group characters will separate it, it combining half of each, but agreeing with neither. The labrum being *distinctly* emarginate distinguishes it from *harrisii* and the coxal processes being rounded, not acutely spinose, separates it from *dauricus*, thus throwing it into the first group with *verticalis*, *hybridus* and *fasciventris*.

From the other three in group I, *marginalis* can be distinguished by the yellow thoracic markings. *Fasciventris* has scarcely a trace, or none at all, of a basal or apical yellow margin, and *verticalis* has none at all; *hybridus* has a fine linear yellow line at base and a fairly distinct margin in same color at apex, while in *marginalis* the basal yellow margin is distinct all the way across and specially broad in its middle portion.

Taking up the three species left in group I, *verticalis*, *hybridus* and *fasciventris*, we can at once separate *verticalis* by its very large size and a subapical yellow line on the elytra running out as a sort of spur from the marginal band near the apical angle and continuing nearly to the suture. Neither *hybridus* nor *fasciventris* has this line.

To separate the two remaining species is very simple, both male and female having very distinct characters.

In the males of *fasciventris* the middle tarsi have the three dilated joints formed into one compact, parallel, spongy cushion, while in *hybridus* this cushion is distinctly divided longitudinally by a glabrous space.

In *fasciventris* the female has the elytra *always* sulcate while in *hybridus* they are *always*, as in the male, smooth.

There are other distinct and interesting characters by which to separate the various species, but I have tried to bring to notice those most readily observed.

The division of the dilated joints of the middle tarsi in the male of *hybridus* by a glabrous space, as mentioned, at once distinguishes it from any other species of *Dytiscus*.

We can summarize the distinctive characters as follows:

D. fasciventris. — Labrum distinctly emarginate; coxal processes rounded, not produced; basal and apical thoracic yellow markings absent, or a mere trace; dilated joints of middle tarsi of male forming one compact, parallel, spongy cushion; females always sulcate.

D. hybridus. — Labrum distinctly emarginate; coxal processes rounded; a fine, linear yellow line at base of thorax and a fairly distinct margin in same color at apex; dilated joints of middle tarsi in male separated beneath longitudinally by a glabrous space. Females always smooth.

D. verticalis. — Labrum distinctly emarginate; coxal processes rounded, not produced; no trace of basal and apical yellow thoracic margins; a yellow subapical line on the elytra starting from the marginal band and nearly attaining the suture. Females smooth.

D. marginalis. — Labrum distinctly emarginate; coxal processes rounded; thorax with a distinct apical and basal yellow margin, the basal one being broader in its middle portion. Females dimorphic.

D. dauricus. — Labrum distinctly emarginate; coxal processes produced, distinctly spinose; thorax at base, apex and sides broadly bordered with yellow. Females dimorphic.

D. harrisii. — Labrum nearly truncate in middle; coxal processes not produced, blunt; thorax at base, apex and sides broadly bordered with yellow. Females dimorphic.

Cybister fimbriolatus. — Distinguished by its wedge-like, instead of regularly oval shape and the generic characters.

Class I, HEXAPODA.

Order IV, DIPTERA.

BRIEF NOTES ON MOSQUITOES.

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DISTRIBUTION OF *THEOBALDIA ABSOBRINUS* FELT. — In re-examining my series of *Theobaldia incidens* from British Columbia (Proc. ent. soc. Wash., vi, 38, 1904), I find it to contain a mixture of a second species which I am able to identify with *T. absobrinus* Felt, both by the larvæ and male genitalia of the adults. This greatly extends the known distribution of this form which was described from northern New York.

IDENTITY OF *CULEX CONSOBRINUS* DESV. — We have examined material collected by Mr. August Busck in St. Louis, Missouri, which Mr. Coquillett considers to be *C. consobrinus*, and recognize it as *C. magnipennis* Felt. It is altogether probable that *magnipennis* is a synonym of *consobrinus*, as we know of but the one larval form and the male genitalia of Mr. Busck's specimens agree exactly with Dr. Felt's figure. Dr. Felt did not know *consobrinus* in describing *magnipennis*. The species will find place in the genus *Theobaldia*, or rather *Culiseta* since *Theobaldia* is preoccupied by *Theobaldius* Nevill, as Mr. Cockerell has pointed out to me.

EXCLUSION OF THE NAME "*CULEX REPTANS*." — Linnæus described a *Culex reptans*, which is not a mosquito, but, on the principle of "once a synonym, always a synonym" the use of the name is precluded in any other sense. The name "*Culex reptans* Meig." must therefore cease to be used.

HIBERNATION OF THE HOLLOW TREE SPECIES. — Of the two spe-